AMERICAN FARMER.

RURAL ECONOMY, INTERNAL IMPROVEMENTS, PRICE CURRENT.

" *O fortunatos nimium sua si bona norint*
" *Agricolas.*" . . . . . VIRG.

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AGRICULTURE.

A New Theory of Agriculture, in which the nature of Soils, Crops and Manures is explained; many prevailing prejudices are exploded; and the application of Bones, Gypsum, Lime, Chalk &c, is determined on scientific principles, by W. GRISENTHWAITE.

(Continued from No. IX. page 68.)

CHAPTER III.

ON MANURES.

Importance of the subject—Analogy between plants and animals—Definition of manures—Enumeration of manures—Fermentation.

In the theory, as well as in the practice, of agriculture, the subject of manures is not only the most important, but the least understood.—Every operation of husbandry, every preparation of land, is calculated to render manure efficacious in its application. It is in vain that the soil is composed of the best substances, in the best proportions; that when so composed, it is kept in the best possible condition for vegetation, unless manure be added to it of such a kind, and in such a state, as is favourable to the growth of plants. In fine, it is that part both of the theory and practice of agriculture upon which every other may be said to depend. The ploughing and harrowing of land; the exposure of it to the frost of winter; irrigation and draining, are all regarded as important, only as far as they adapt it to the reception of manure, and are calculated to render its uses in vegetation more serviceable.

It is an unfortunate circumstance in this department of agriculture, that the same dependence has been placed on experience, unassisted by science: and observation, too limited for general conclusion, that I have had occasion to complain of, when treating on the subject of soils. Where the shepherd kept his flock, he might afterwards witness more luxuriant herbage, than in situations apparently similar, but, where they had not been kept. This and many other accidental occurrences would soon satisfy the mind of the most negligent and incurious, that the productiveness of the soil might be greatly assisted by artificial means. Without theory, or principle, he would seize on every instance of successful vegetation, and endeavour to imitate the means that had rendered it so. He would collect leaves, and store the dung of his animals, and thereby accomplish much, although he would leave many important resources entirely disregarded; but this, his first step, would be an advance so far in the practice of husbandry, that it would see nothing excelling itself for many centuries; even now, little, very little more is done than was thus accomplished by the first rude improvements of uncivilized man.

The probable reason why so little knowledge has been acquired concerning the manner in which plants derive nourishment, may be found in the obscurity of the processes of vegetation; every thing is done imperceptibly to human sense; the roots are silently and incessantly at work, absorbing the soluble substances in the soil, whilst the leaves are constantly performing the same functions, unperceived, in the air. Observation can detect nothing. It required much patient investigation, and many well directed experiments to be made, before these powers, and offices of the roots and leaves were discovered. It was not the practical man that explored the secret recesses of vegetation, or attempted to develope its laws. It was philosophy, with its complicated apparatus, and its comprehensive views, that led men into the laboratory of nature, and explained the manner in which she conducts her operations. The results to her labours, have unfolded many truths of the greatest importance to agricultural practices; amongst which that of the preparation, and adaptation of manures to purposes of husbandry, is not the least.

The analogy which has been confessed to exist, in many respects, between animals and vegetables, is, perhaps, in no particular more striking than in that of deriving nourishment for subsistence, and growth.

The first changes which take place in the germination of a seed, as have been already observed, consist in the abstraction of a quantity of its carbon, by the oxygen of the air. In the same manner respiration in animals consists, in the abstraction of a quantity of carbon from the blood. In both cases heat is generated, and the same products formed. In the stomach of animals the food undergoes such changes as render a great proportion of it soluble, which is a property indispensibly necessary, in order that the delicate capillary vessels, called lacteals, and which open into the prima via may be able to take it up for the nourishment of the body, and for glandular secretion; so the earth may be considered the stomach of vegetables; and the fibres of the roots as vessels performing offices analogous to those of the lacteals in animals. They can absorb nothing but what is in solution, in that state must be presented the pabulum of life, and the substances from which glands, or similar organs, form, or secrete the various vegetable bodies with which we are acquainted.

When a parrallel like this can be traced between two operations, although it furnish only probable evidence when carried further than observation reaches, yet it is a mode of reasoning allowed by the most rigid logicians, where more direct, and positive evidence cannot be attained and it is highly conducive to the extension of scientific knowledge; suggesting enquiry, and directing our views, in the prosecution of it. In the course of this chapter, I shall have occasion to pursue the analogy between animals and vegetables a little further than I have done in this place.

Before I proceed to make any remarks on the subject of manures, it will be convenient and proper, to define what is to be understood by that term. In this instance, I believe, the vulgar notion is not so much at variance with philosophical truth, as in many others. Every thing which contributes to promote the growth of vegetables, may be considered as manure.—The practical man regards every indiscriminate kind of refuse matter as manure, but that opinion, a very little reflection, will shew to be incorrect.

Although the agriculturist has fancied every species of refuse matter to be manure, yet he is willing to acknowledge, that it is not always in a suitable condition to put upon the land, but frequently requires a previous preparation. It is rather surprising that this circumstance never started in his mind the consideration, whether all the substances which he is now pleased to call manure, are capable of undergoing such preparations, and, if not, whether they have any value whatever, when so employed.

Every species of matter capable of promoting the growth of vegetables may be considered, as has been already observed, as manure; and we shall find, on examining the constituents of vegetables, that they are composed of oxygen, hydrogen, carbon and nitrogen, or azote, with a small proportion of saline bodies. It is evident, therefore that the substances employed as manure, should also be composed of these elements, for unless they are, there will be a deficiency of some of the elements in the vegetable itself; and it is probable, that such deficiency may prevent the formation of those substances within it, for which its peculiar organization is contrived, and upon which its healthy existence depends.

This may, perhaps, explain the cause why soot has sometimes been found to afford very little nourishment to vegetation, it consisting principally of carbon, uncombined with oxygen and hydrogen. It therefore, could contribute only one of the elements of vegetables, where three, at least, were wanted. This affords us an example in which chemistry is of great utility in explaining the physiology of vegetation; and, as will be shewn hereafter, in adapting means to render agricultural processes more certain.

The elementary bodies above enumerated, namely oxygen, hydrogen, carbon, and nitrogen, or azote, are all contained in animal, and the three first in vegetable matters. Sometimes vegetables, though very seldom, contain a small quantity of nitrogen. As certain salts are also constantly found to be present in healthy living vegetables, manures may, consequently, be distinguished into animal, vegetable, and saline

It seldom happens that vegetable matter is employed as manure, except as it may, accidentally, form a part of what is collected in the farm yard, and perhaps, the leaves of trees, which are gathered in autumn. Undecayed woody fibre, or substances containing it, are not considered to be suited to the purposes of manure before they have undergone a kind of decomposition, by which continuity is destroyed, and a soluble, pasty matter is obtained. Hence the formation of dung heaps, which are, perhaps, as now conducted, the most serious enemies of the agriculturist.

The object of this decomposition is, as has been stated, to produce a soluble out of an insoluble substance; and the process by which it is effected is called fermentation; which it resembles so far as it consists in the spontaneous formation, and extrication of carbonic acid gas, and the generation of heat. It ought to have been remembered that of the substances most disposed to fermentation, those which are soluble, are most susceptible of it, and, consequently, if such a process have a tendency to produce soluble substances, it has also a tendency to destroy them. According to the experiments of *Lavoisier* and *Thenard*, one hundred pounds of sugar, and ten pounds of yeast, yielded no more than about fifty-eight pounds of alcohol, and six pounds and a half of residue, after fermentation; so that when the water contained in the alcohol, and which could not be separated, is deducted, we may infer, that full half of the original materials were lost or destroyed. A part of the loss consisted of thirty-five pounds of carbonic acid gas. Hence it appears how injudicious is the plan of fermenting manure, if the fermentation resemble that just stated; not only in the absolute loss sustained, but because the carbonic acid gas, if disengaged during the processes of vegetation, is peculiarly adapted to aid that process; being soluble, and therefore capable of being absorbed by the roots; being æriform, and therefore may be taken up by the leaves.

We know but little of the nature of those changes which take place during the spontaneous fermentation of a dung heap. Whether the products be soluble or not, or volatile, or fixed, have not yet been discovered. But, however ignorant we may be of those changes, no one can deny that they should be well understood by the practical farmer, for upon them depends the success of one of the most important departments of husbandry.

I have stated that all kinds of manures consist of substances that possess the distinctive properties of animal or vegetable matter, excepting a few, which are saline. As those substances are seldom employed in an unmixed condition, it is probable that the nature of those changes have, in consequence of that circumstance, been less attended to. When a variety of materials are blended together, and any spontaneous alteration is observed to take place in them, it is a difficult thing to assign the cause of such alteration. The particular substance which induced it, or whether it was occasioned by the united influence of all, as it is not very apparent, so it excites but little enquiry. Observation could not discover much, theory can explain more; but that that theory may afford all the information possible, it will tend very much to facilitate our progress, if we consider the nature of those spontaneous changes, which animal and vegetable substances undergo, the products they form, and the manner in which those products are likely to conduce to the purposes of vegetation.

Animal substances, are composed either of fibrin, as in the muscles and blood—gelatine, as in cartilage and bone; or coagulated albumen, as in nails, skin, hoofs, &c. The constituents of those several animal substances, are not very different in their proportion; and in their nature, they are precisely the same. Gelatin is composed of

Oxygen	27.2
Carbon	67.88
Nitrogen	10.99
Hydrogen	7.9

Fibrin of

Oxygen	19.68
Carbon	53.36
Nitrogen	19.93
Hydrogen	7.2

and Albumen of

Oxygen	23.87
Carbon	52.88
Nitrogen	15.7
Hydrogen	7.54

If we suppose the first of these to undergo a spontaneous change in the arrangement of its constituents, without the superaddition of any other extraneous substance, we shall find, that there might be formed, out of every hundred parts of gelatine about twenty of ammonia, twenty-seven of carbonic acid gas, twelve, and eight-tenths of carburetted hydrogen, and forty-one parts of carbon; the last of which would remain behind, in a state of extremely minute division.

That these changes do take place to a certain degree, has been proved by examinations of the products which are spontaneously evolved.—*Sir Humphrey Davey* discovered in the gasses extricated from a common dung heap, a quantity of carbonic acid gas, carburetted hydrogen, ammonia, and acetic acid; the last of which, it is probable, was furnished by the vegetable matter of the heap. It here appears evident, that if the process of fermentation be allowed to proceed uninterruptedly, in animal substances, as long as it is capable of proceeding that sixty per cent of the whole weight will be dissipated, leaving but forty per cent as nourishment to vegetation, and every grain of that forty insoluble; but its being in a minutely divided condition, renders it capable of entering into combination with oxygen gas, &c. to form soluble compounds with greater facility than it would have possessed in a state of aggregation.

These would be the consequences of fermentation conducted to its extreme length. It probably never reaches so far; when it does, there is found remaining behind, a kind of black mould. That, in common practice, it is carried a great way, is obvious, from the blackness of some parts of a dung heap, when it arrives at that state which the farmer calls well rotted. The blackness can proceed from nothing else, than the evolution of the carbon of the substances contained in the heap; every pound of which indicates the loss of one pound and a half of other substances, of the highest importance to vegetation.

We have seen what loss is sustained during the fermentation of one vegetable substance, and it is probable, that there is not less lost in those which form the constituents of a dung heap.—These are reasons sufficiently strong to discourage the practice of allowing dung heaps to ferment, and rot without interruption. It appears that public opinion has slowly adopted the decisions of chemical reasoning, and pies have been formed with a view to save what was before lost; a stratum of mould, sustaining the heap, being placed to receive the fluid parts, and a covering of mould being applied to prevent the dissipation of the aerial, or gaceous products. These purposes and contrivances, unfortunately, like many of the other operations of husbandry, were not directed by scientific knowledge. To cover is so commonly believed to confine, that there is no wonder, that the practical farmer adopted it in this instance from such a consideration. But it is in vain—the elasticity of the gasses generated, is such as no covering whatever could possibly confine.—If it were perfectly compact, it could only preserve as much carbonic acid as is equal to the volume, or bulk of air within it; a quantity too inconsiderable to be regarded, could it even be saved; but every particle of it must be disengaged and lost when the covering is removed.

It having been determined that no substance can act as manure unless it be soluble, and in a state of solution, it is proper that we should be acquainted with those which are naturally so; those that by a spontaneous, or artificial change in the proportion of their constituents, may be rendered so; and the best means that can be employed to effect such change.

Amongst the animal substances, that are commonly employed as manure, there are none besides those of the farm yard; and they, it is probable, can undergo no change capable of improving their quality. Of those that may be occasionally employed, such as fish, the refuse of the whale blubber, bones, rags, &c. which are composed of the substances already enumerated, either a spontaneous change in their constituents must be allowed, or it must be encouraged, by artificial means.

It is well known, that fibrin, by the action of nitric acid, is converted into gelatine; in which experiment, it is probable, that little change is effected more than what is produced by the oxygen of the acid: and, if so, perhaps the action of air, and moisture, might occasion the same. Similar results have also been found to take place with coagulated albumen, and, it is most likely, from the same cause.

Fibrin has been found converted, under peculiar circumstances, into a fatty substance, which *Fourcroy*, who examined it, as discoverd in the graves of the burying ground, *des Innocens*, called *adipocere*. The same change has been effected by immersion in a running stream. In both cases it resembled spermaceti and possessed all the properties of a concrete

oil. Whether such, or equally efficacious processes could be generally adopted, or whether they would be accompanied by a loss that would render it unprofitable, has never, I believe, been determined.

They are too little understood, to be recommended for general adoption; but there are others with which we are better acquainted, and which are more within the limits of practical husbandry.

Most animal substances are soluble in caustic alkalies, and what the alkalies effect completely, some of the alkaline earths can accomplish in a less degree. This is particularly the case with lime, which, it is well known, will accelerate the dissolution of animal bodies. The nature of this action, has never been satisfactorily explained. I was induced to try the following experiment in order to determine, whether the alkalies, and, if so, probably the alkaline earths also, act upon animal matters, in the same manner as they do upon several metallic peroxides, namely, that of abstracting from them a portion of oxygen: That this is not the case, became evident, when, instead of a pure, caustic alkali, I employed either a hydrosulphuret, or a hydroguretted sulphuret, for then no action whatever took place, which would have happened more readily, if the action of the alkali had been referable to its deoxydizing power. Since the caustic alkali acted very powerfully, and the hydrosulphuret, as well as the hydroguretted sulphuret produce no sensible effect, it appears not improbable that the sulphur, which is always to be found in coagulated albumen, and perhaps in fibrin, may be the bond of union that holds the other constituents together. If so, the first spontaneous change which those substances undergo will be to form sulphuretted hydrogen gas, which will escape; a loss of considerable importance, if those substances be contained in the manure designed for the turnip crop, as will be seen hereafter.

From what has been already advanced concerning the nature of animal substances, as they are found in farm yard manure, it is obvious that little artificial assistance is necessary to adapt them to the purposes of vegetation.

Another inference of considerable moment, may also be drawn from the preceding observations, namely, that as such substances cannot be altered in their properties with any advantage, and they are constantly undergoing alteration, that such change may be detrimental to the interest of the agriculturist. Perhaps it may be said, that if the animal matter of farm yard manure, does not itself improve by being mixed with the straw, and other vegetable substances there found, yet such a mixture is calculated to accelerate the decomposition of those vegetable substances. This I believe to be true with respect to soluble vegetable substances; that it promotes their alteration, is confirmed by the authority of *Dr. Pringle*.—But we have no experiments to sanction the conclusion, that insoluble vegetable matters are aided in their decomposition by such admixture. Moist hay undergoes fermentation independent of animal matter; and, it is probable, that moist straw would also; and if so, how advantageous must it be to collect, as is done in Flanders, all the fluid drainings of the farm yard, and to preserve all the animal matter in such a state, as shall most completely resist decomposition.

It is probable, that if the views of the agriculturist, instead of being confined to one crop, were directed to improve the general quality of the soil, as regards vegetation, that many practices now disregarded, would be then adopted. much that is lost would be saved, and the whole business of husbandry be rendered at once more simple and economical. In confirmation of this opinion, it is only necessary to state, that land manured with chips of wood, became, after the elapse of three or four years, exceedingly productive, in which time they had undergone a decomposition; and the fertility remained until the eleventh year. If a small quantity had, annually, been added to the land, its condition might, probably, have been perpetuated. It is on this principle that woolen rags are employed on the hop grounds of Kent; and it is from this cause, that the recently broken up forests of America, are so rich in vegetable manure.

This plan of employing manures that are not susceptible of a speedy, spontaneous docomposition, and which are never subjected to that process without sustaining a loss of full half of their weight, might I think, under judicious management, be made to promote the interests of the farmer. The immense addition it would make to the quantity of his manure, is a sufficient reason to justify its being tried.

That the preceding object has been much disregarded, or little known, is obvious from the practice generally adopted of burning weeds, and sometimes paring and burning land preparatory to cropping. That such practices should be followed in the ninteenth century, is not a little surprising; but, when the inconsiderable progress which Agriculture has made in principle, is known, the surprise ceases.

However glad a farmer may be to free his land of weeds, where they do injury, he should not neglect to employ them afterwards in that manner that may make them restore, with ample interest, the whole of what they had collected from the soil. Weeds are composed of the same elements as other vegetables, and it is only whilst vitality pertains to them, that they can do any mischief to the processes of vegetation. To burn them is to annihilate them, at least as far as they concern the farmer; but if, instead of burning them, they were heaped together with a small quantity of caustic lime, or even mixed with the collection of the Farm Yard, they would make a useful addition to the stock of manure.

In the same manner, the surface of land, which is now recommended to be pared and burned, in order to be brought into a state fit for cultivation, might be managed so as to accomplish equally well the object desired, and in addition to produce an immense quantity of vegetable manure, which is now voluntarily destroyed. The surface of such land consists principally of vegetable matter, every hundred parts of which by the operation of burning is reduced to less than ten, and consequently ninety parts are lost, every one of which might have proved beneficial to land in want of vegetable manure. Instead of burning the surface, if it were collected, and used in the preparation of composts, in the manner lately recommended, and experimentally approved, with peat moss, in Scotland, there is no doubt but the advantages would be so great, and obvious, as to discourage altogether this most injudicous practice.

As this practice is, probably, not generally understood, it may not be altogether improper to give a brief account of it in this place. "After the peat is cut, and dried, it is fit for being made into manure, which is thus effected. A stratum of peat, of six inches in thickness, is covered with a stratum of dung ten inches in thickness; then six of peat, then four or five with dung, then another thin laver of dung, and then the whole is covered over with peat. In mild weather seven cart loads of common Farm Yard dung, are sufficient for twenty-one cart loads of peat moss, but, in cold weather, a larger proportion of dung is desirable." If the surface of land intended to be burned, be employed in the same way that peat is here used, there can be no reasonable doubt, but equal advantages would result from the practice.

Paring, and burning have been approved from the supposed value of the ashes left after such an operation, but the approbation will be much diminished, when it is remembered, that burning adds nothing to those ashes; that it removes all the oxygen, hydrogen, and ninety-nine parts out of every hundred of carbon; and the saline bodies discovered in the ashes existed before in the entire vegetable. If the land, where the turf is cut, be already so provided with vegetable manure as to spare, with advantage, all that is commonly consumed by burning, yet it is more than probable that several other portions of land, in its neighbourhood are deficient in it, and therefore, it might, after previous preparation, be transferred, with great benefit to such land. This is an improvement in Agricultural practice which will certainly be adopted whenever it is properly understood.

(To be Continued.)

The SHEEP of Peru

Are exceedingly valuable, and ought to be introduced into the UNITED STATES OF NORTH AMERICA.

NEW-YORK, April 28th, 1821.

SIR,

As the time appears to be fast approaching when the intercourse between *Spanish America* and the civilized world will be no longer impeded, by those unnatural and barbarous restrictions which the policy (or rather the impolicy) of Spain has hitherto imposed, and as the greater part of the Southern Continent of America will probably, in a few years, be entirely freed from the political control of Spain, every thing relating to the animal, vegetable and mineral productions of those regions will become every day more interesting, and as the intercourse with those countries and the United States will be steadily augmenting, there is no doubt in my mind, that many of the choice productions with which nature has gifted the great Continent of South America, and which have

so long been shrouded in obscurity, will shortly be brought to light, and that instead of the precious metals, constituting the great object of mercantile speculation to those countries; our enterprising citizens will speedily discover *other objects* equally, and perhaps, far more important than any hitherto known to the commercial world.

The present observations will be limited to one of those new objects, viz.—*The introduction of Peruvian Sheep into the United States.* I venture, without any hesitation, to assert, that the individual, or individuals, who succeed in first landing in the United States, a pair of the sheep hereafter described, would not only be compensated in a pecuniary sense, equal to their most sanguine expectations, but would render a greater service to our country than if they introduced all the mineral wealth of Peru.

The Spanish government as well as the Spanish writers, have contributed to spread a vulgar error respecting these sheep. They have stated that two of the species cannot be domesticated, and that the other two species which are already domesticated in Peru, will not thrive or procreate when removed from their native regions. The subsequent remarks, we hope, will destroy all doubts on this subject.

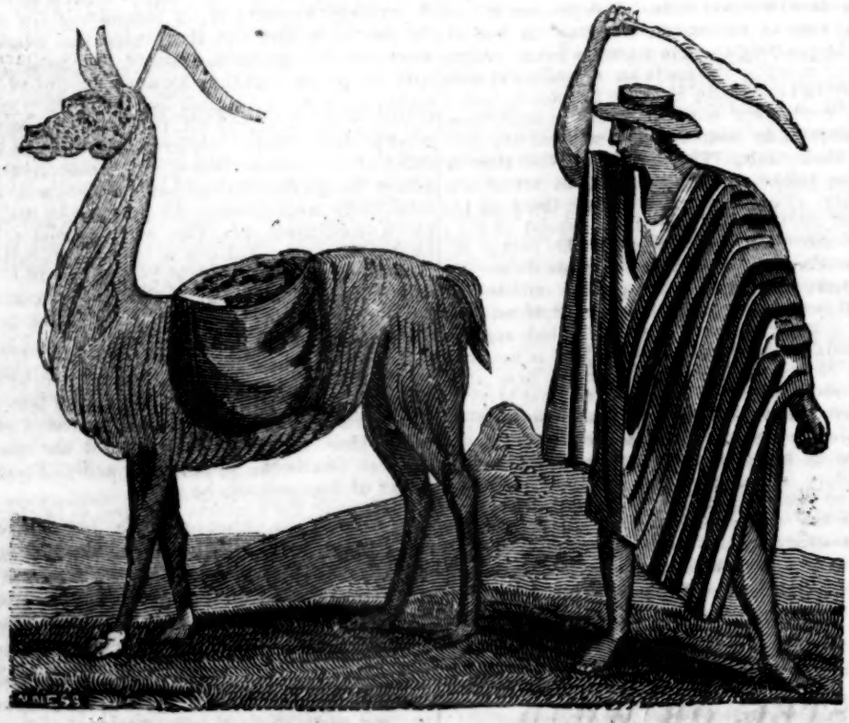
I have conversed with many intelligent South Americans, have perused several interesting manuscripts and publications respecting these Peruvian sheep, have seen the four species in various situations, and have not the least doubt that they can all be domesticated and brought from Peru to the United States, where they will find a congenial climate and food in the mountains of every state in our union.

The best treatise I have seen on these sheep, was published in London, in 1818, by William Walton, Esq. and as the facts therein contained, correspond in essential points with what I have gathered from personal investigation, and the manuscripts before alluded to, I shall avail myself of Mr. Walton's treatise for many of the facts contained in the following description of each of the species of Peruvian sheep, recommending to those who may wish a more minute description of these beautiful and interesting animals, to send to England for Mr. Walton's publication on the subject.

It will give me much pleasure should this brief account awaken the attention of our agricultural societies, of our public agents in South America, and of our merchants trading to those regions, because I feel persuaded that the more the subject is examined, the greater importance will be attached to it, and I flatter myself that in a few years hence, these Peruvian sheep will be introduced and spread over our country, in the same manner as has already taken place with the Spanish Merino, and other foreign breeds.

WILLIAM DAVIS ROBINSON.

THE LLAMA.



The ordinary stature of the Llama is from four to four and a half feet in height, and from three and a half to four feet from the pit of the chest to the rump—they sometimes have been seen at Casco, upwards of five feet in height.—From the manner the Lama carries his lofty head, and habitually stretches his neck, he appears taller than he really is.

The one now exhibited at Piccadilly, in London, is only about three feet ten inches in height—and although cramped by confinement, deprived of his native climate and congenial food, yet it is found that his wool has improved, having much less hair mixed with it, than the first time it was shorn in England.

The Llama is the largest and most robust of the four species of Peruvian sheep—they will bear a burthen of one hundred pounds, with which they will travel over mountainous regions, more rapidly than either the mule or ass.

The eyes of the Llama are black, very soft and expressive—his limbs are as clean as those of a deer, and when in active motion, he carries his ears erect, like those of a horse when alarmed. The whole body is covered with a soft wooly coat of hair, but which does not curl or drop off like that of the camel. The finest wool, and that which is the least mixed with hair, is on the back and rump of the animal.

The common color of the Llama is a light brown, but it sometimes has been found purple, and occasionally grey, but never party colored—under the belly he is universally white, and it is there the shearer collects a separate lot of wool. The whole of the four species of Peruvian sheep are remarkable for cleanliness, and their fleeces are divested of that greasy quality and offensiveness peculiar to the sheep of other countries.

The softness and abundance of the Llama's coat makes a pack saddle under the load unnecessary; and as the Peruvian Indians prefer the fleeces of the other sheep, they seldom rob the Llama of his cloathing, but there are certain parts of him which yield a wool peculiarly fine.

The Llama, as well as the three other species, ruminates and chews its cud, the same as a cow, but like the camel, seldom requires drink—he will pass weeks and months without being known to take a draught of water—the moisture contained in their green food appears to be sufficient, and even the one in London, although fed on dry hay, grains and carrots, for several months during the year, has been known to drink only once in four weeks from a bucket of water placed near him.

The meat of the kid Llama is excellent, but that of the old sheep is tough, and seldom used by the Indians.

The gait of the Llama is peculiarly majestic, and is so extremely sure footed, that when the panniers are perfectly poised, there is no need of pack saddle, bridle, crupper or girth; and he is under such perfect command of his driver, that even in droves of two or three hundred, they march in such order as never to interfere with each other, and in this respect are far superior as beasts of burthen, to either the Mule or Horse.

Although very docile, he is extremely sensible of ill usage—if overloaded, or overworked, he lays down, and is generally raised by coaxing and patting him. The usual age to which the Llama lives, is about fourteen years—he is fit for labour at the age of three. I have no doubt he would find a congenial climate in many of the mountainous regions of the United States; and as to food, there remains no question, from the experiments which have already been made, that our country furnishes every thing necessary for his sustenance, and perhaps by crossing the breed, the fleece would be improved, and divested of that portion of hair with which it is at present intermixed.

(TO BE CONTINUED.)

ARRACACHA,

A vegetable of South America, superior to the IRISH POTATO, *which it resembles.*

We are endeavouring to collect the best information we can, respecting a vegetable called Aracacha, said to be a native of South America, and to be more valuable than the Irish Potato, which it resembles. We propose to place the result of our enquiries into the hands of some of our publick spirited merchants trading to that country, in the hope of introducing the vegetable into our own. A letter was addressed to Doctor Mitchell on the subject, expecting, from his universal knowledge, and his amicable relations, and scientific correspondence with all quarters of the world, to derive the desired particulars of information. The Doctor referred us to Mr. Robinson as a person most likely to satisfy our wish, and from a very interesting letter received from Mr. Robinson on some other subjects, we extract what relates to this. —*We add* what we find on the same topic in that valuable work, of Doctor Mease's, "The Archives of Useful Knowledge"—and we entreat the attention of our merchants to the subject. By some of their captains or supercargoes, these vegetables might be had, and they themselves, may acquire the best of all renown, that which springs from doing solid good to their country. The object in view, would be the more readily attained, if some of the editors in the sea port towns would have the goodness to copy this. *Edit. Am. Farmer.*

Extract from Mr. W. D. Robinson's Letter.

I regret that I cannot answer satisfactorily your inquiry respecting the Arracacha of South America, further than that I have several times eaten a *root* produced in *Guatimala*, which is not merely a substitute for the yam and potato, but in my opinion far superior to either.—I do not remember the Indian or Spanish name for the root in question, but it was represented to me as an indigenous production of Guatimala, and has been transplanted to the province of *Oaxaca* in Mexico, where it thrives as well as in its native regions. It is about two to three pounds weight, but is said to have been produced as large as to weigh ten pounds. I have seen it of various colours, particularly purple and violet, but the white is most preferred by the Creoles—it is as mealy as the finest Irish potato, and contains I think more nutritive qualities—I have heard some extraordinary statements of the quantity of this root raised in a fanega of ground, but one fact is certain that it produces a return to the planter or farmer, far greater than any thing known in South America.

I conceive it an object of such importance as to justify your adopting every practicable means to get it introduced into the U. States, and I am in hopes that before long an intercourse will be opened for trade to Guatimala, which will enable you to effect the point.

But I think that if you were to address some intelligent individuals at Havana, you could obtain precise information on the subject, because there is a considerable intercourse between Guatimala and Havana.

There is an infinite variety of productions, vegetable and animal, in South America and Mexico, that have hitherto been scarcely noticed, and which opens an interesting field for the scrutiny of the naturalist and philosopher—how many indigenous productions of those vast regions may be transplanted to other countries, and there flourish in the same manner as the potato and tobacco plant has done?

New-York, May 19, 1821.

Extracted from the Archives of Useful Knowledge, vol. 2—page 298.

TO MERCHANTS TRADING TO THE SPANISH MAIN.

The merchants who trade to *Carraccas* and other parts of the *Spanish* Main, are requested to endeavour to introduce into this country, a very valuable South American plant, an account of which was given by Mr. Vargas, in London, and published in the annals of Botany, No. 2, *p.* 400. The popular name in South America is Arracacha, and it is one of the most useful plants in that country—Order, Umbelliferœ; in its habits it resembles an Apium, and therefore sometimes called Apio. Its stalk generally divides from the upper part of the root into several stems, thickly beset with large orbicular leaves gashed into several sinuses, and supported by large tubular petioles, exceeding a goose quill in thickness—the roots immediately divide into four or five branches; and each of these, if the soil be light and the weather favourable, will grow to the size, and have nearly the shape of a large cow's horn. This root yields a food which is prepared in the kitchens in the same manner as potatoes. It is extremely grateful to the palate, more close than mealy; it is so tender that it requiries little cooking, and so easy of digestion, that it is the common practice of the country to give it to convalescents and persons with weak stomachs, being thought much less flatulent than potatoes. Of its fecula is made starch, and a variety of pastry work; reduced to a pulp this root also enters into the composition of certain fermented liquors, supposed to be very proper to restore the lost tone of the Stomach. In the city of Santa Fe, and indeed, in all places of this kingdom, where they can obtain the Arracacha, they are of full as universal use as the potatoes are in England. Its cultivation requires a deep black mould, that will easily yield to the descent of the large vertical roots. It is propagated by cutting the root in pieces, each having an eye or shoot, and by planting these in separate holes. After three or four months, the roots are of sufficient size and quantity to be used for culinary purposes; but if suffered to remain six months in the ground, they will often acquire an immense size, without any detriment to their taste. The colour of the root is either white, yellow, or purple; but all are of the same quality. The most esteemed are those of Liparon, about ten leagues north of the capital (S'Fe.) Like the potato, it does not thrive in the hotter regions of the kingdom, for there the roots do not acquire any size, but throw up a greater number of stems, or at best they will be but small and of indifferent flavour. It thrives best in the elevated regions of the mountains, where the medium heat is between 58 and 60 degrees of Fahrenheit's scale; here it is that these roots grow most luxuriantly, and acquire the most delicious taste. Mr. Vargas believes it peculiar to the province of Carracas and kingdom of Santa Fe, as he has met with it in no other part of America where he has been, nor is it spoken of by any writer on America, except by Alcedo, who mentions it in a few words at the end of his Diccionario Geograpico—Historico de las Indias occidentales o America. It is indeed surprising, that such a useful vegetable should not yet have found a writer to make us acquainted with its history, or a Sir Walter Raleigh, to convey it as a valuable present to other regions, as it might easily be conveyed by seeds or roots.

PASTEL, OR WOAD,

Furnishes early and late pasture, is necessary in dyeing blue, and may be profitably cultivated to make Indigo, in the U. States.

BRINLEY PLACE, ROXBURY, Jan. 23, 1821.

DEAR SIR—Please to accept my sincere thanks, for the number of your American Farmer,* containing remarks on the culture of Pastel or Woad, which you have been so kind as to transmit me.

As practical knowledge is indispensably necessary, to test the correctness, utility and importance of theory, I send you a number of the Massachusetts Agricultural Repository for January 1817, containing the account of an experiment, on the cultivation of Pastel, and the extraction of the colouring matter, from its leaves, which I made, subsequent to the publication of a translation of Lasteyrie's valuable work.

Notwithstanding the facility, with which Pastel can be cultivated in this country, and manufactured into paste, cakes, or pelotes, for the the use of the dyer, considerable quantities, thus prepared, are annually imported, chiefly from England.

As common indigo is cheaper in the U. States, than such as can be extracted from Pastel, it will be generally used, as the basis of blue colours, except, perhaps, during war, or when a sufficient supply from any cause, cannot be obtained;—but the importance of Woad to foment the "*indigo vat*," and to give a superior and permanent colour to cloths, and for which there is *no substitute*, is now, so universally known, that no dyer, who is ambitious of acquiring celebrity for the perfection of his colours, expects to acquire distinction, without the aid of that substance. With great respect your most obedient servant,

H. A. S. DEARBORN.

J. S SKINNER, Esq.

EXTRACT from the 3d No. of the 4th vol. of the Massachusetts Agricultural Repository.

The public are indebted to General H. A. S. Dearborn, of Roxbury, not only for the translation of an admirable treatise of P. C. De Lasteyrie, on the culture, preparation, history, and analysis of Woad, but amidst his numerous public avocations, for his spirited and judicious experiments upon its culture, and the process of obtaining a pigment from it.

The Trustees of the Massachusetts Society for Promoting Agriculture, in submitting his letter to the public, tender him their respectful acknowledgments for his interesting communication. They assure the public that they have a specimen of the pigment obtained by General Dearborn, very nearly resembling, in colour and all its sensible properties, the most perfect indigo. General Dearborn, in the true spirit of a patriotic citizen, also authorizes them to assure the public, that he has two bushels of Woad seed ready to be given to any person who may be disposed to cultivate it.* The work translated by Gen. Dearborn may be had gratis by the Agricultural Societies throughout this state, by applying to J. Lowell, Corresponding Secretary of the Massachusetts Agricultural Society; General Dearborn having presented certain copies for this end.

Before we insert General Dearborn's letter, we would observe that a French gentleman of science, Monsieur De Caritat, has recently, in a letter to the New-York society for the encouragement of manufactures, thus noticed and confirmed the opinions of General Dearborn. Speaking of a Mr. Treytorrens, a dyer of Switzerland, he says:

"Through the kindness and zeal of Doctor Mitchell and Mr James Robertson, with whom I have made him (Mr. Treytorrens) acquainted, he had knowledge of a work just published in Boston, and sent by the translator, Mr. H. A. S. Dearborn, to the former gentleman. When he had ran it over and examined it, he came again to me, wishing I should state to you his observations and discoveries, either relative to the subject, or some other branches of his profession, tending to shew his devotedness to his adopted country, and particularly its manufactures.

"The following are nearly his words:—"Pastel or

* No. 42, of the 2d. vol.

* The Editor of the American Farmer, still has on hand, a part of the Woad seed, which was recently placed with him for distribution by John Le Messurier, Esq. of Virginia:—He has sent parcels of it to many persons, and any one who may wish to cultivate the plant shall be promptly supplied with some of this seed on application being made to us in person or by letter: it is fresh and good.

Woad, on which a treatise has just been published in Boston, is well known and familiar to Mr. Treytorrens, not as having cultivated it himself, which however he often saw and observed in the soil, nor manufactured, though acquainted with the process; but as having employed its product for dyeing. Its quality, and its *indispensible use* with indigo to obtain a deep, rich, and superfine blue colour will be the sole end of his remarks now. Without Pastel or Woad, or a substitute perfectly analogous, according to him, there is no possibility of dyeing a deep unchangeable blue, (let the materials be what they will,) of a superior quality. As this plant is not indigenous to the U. States, and has been in Europe considered by the learned among many of a similar nature, *as deserving the preference*, the treatise concerning it, and especially the success of the experiments made here, for cultivating the same, must of course be regarded *as most precious and valuable acquisitions.*" Mr. Treytorrens then goes on to speak of a substitute for Pastel, but which he does not pretend to say is better, and which he calls Milk-weed, or Silk-grass. What this plant is, or what part of it is used, does not appear. It will not, we are persuaded, supersede the valuable plant described in the following letter.

BRINLEY-PLACE, (near Boston) Oct. 28, 1816.

As a citizen of Massachusetts, I feel great solicitude in every thing which may contribute to render the products of her soil of importance to the nation, and render the labours of the Agriculturist profitable.

As the society of this Commonwealth for the encouragement of those objects, have recommended experiments and invited communications on all subjects interesting to the farmer, I herewith transmit a number of copies of a work, which I have translated from the French, on the culture of Woad or Pastel, and the use of its blue pigment in dyeing.

Desirous of testing the correctness of the experiments which are therein detailed, of the best methods of cultivating Pastel, and extracting the indigo from the matured leaves of the plant, I sowed a piece of ground early in May, in drills, three feet apart, and at the first weeding thinned out the plants so as to have them six inches apart.

On the 15th of August, I cut a part of the leaves, which covered one sixtieth part of an acre, and pursued the process contained in the *Information upon the Art of extracting Indigo from the leaves of Pastel*, published by order of his excellency Montalivet, Count of the empire and minister of the interior; contained in the treatise transmitted. The experiment succeeded to admiration, and I herewith send you a sample of the Indigo obtained.

The fermentation was perfect at the expiration of 48 hours. The liquor being drawn off from the vats one bucket of lime water, prepared agreeably to the directions contained in the treatise, was added to two of the liquor, and then agitated with a small wooden rake for fifteen minutes, when a most copious white froth arose to the surface, which soon assumed a bright blue colour. This froth was carefully skimmed off and put into earthen bowls to dry, and gave me a quantity of "*fleuree*," as mentioned at page 138; a part of which I send you.

The green flocculi were deposited in two hours.—The superincumbent yellow liquor being drawn off, an ounce of sulphuric acid, diluted with water, to every bucket of the liquor, was poured into the green precipitate, which instantly changed it to a most beautiful cerulean blue: cold water was then poured into this admixture and violently agitated for ten minutes.

Twelve hours after, the liquor was drawn off, and the blue deposition put into cloth filters to drain. In twenty-four hours, the indigo was perfectly drained, taken out, and put into a box with a linen bottom, which was placed in an airy situation, under cover. At the expiration of seventeen days, it had become a tenacious paste; was then taken out with a wooden knife, and pressed into small boxes to dry. In two weeks the Indigo was perfectly dry.

At the expiration of twenty days, the plants which had been cut, were grown sufficiently large to cut again; which would give of course, three cuttings a year, in this northern climate; but if sown in Sept. there might be four, if not five cuttings a year. As the plants are not injured by the frosts of winter, they would, in this way, be fit to cut in June.

From this experiment, I am satisfied the following quantity of indigo could be made from an acre of ground. One cutting from one sixtieth of an acre gave, of indigo, half a pound. One cutting from one acre, therefore, would have given thirty pounds. The present price of indigo is two dollars per pound; therefore, one acre of land, cultivated with Pastel, would produce to the farmer, 200 and 40 dollars.

I wish you to distribute some of the books I have sent, among the different agricultural societies in this state, and the remainder in such manner as will best tend to diffuse a knowledge of the advantages which the agriculturists and dyers of this state may derive from the cultivation and use of Pastel.

If the present pacific state of the world be adverse to the extension of the cultivation and use of Pastel, as a dyeing material, it is nevertheless important, that the advantages which the different sections of our country may reap, at some future period, from this plant, should be known, when less favourable circumstances shall combine, to deprive us of colouring ingredients, now so easily obtained, from every part of the globe.

During the war, indigo was four dollars a pound in New-England and New-York.

It is of the first consequence to a nation, that it can, at all times, be able to rely on the resources of its soil and industry, for, not only the necessaries, but the luxuries of life.

The resources of the United States are as yet, very imperfectly developed, but the rapid advances, which are now making in chemistry, mineralogy, botany, agriculture, and the mechanic and fine arts, warrant the most favourable anticipations of the future glory, prosperity, happiness and real independence of the republic.

Besides the advantages resulting from the cultivation of woad, as a pigment for dying, it is indispensably necessary for fermenting the *indigo vat*. For this purpose, the green leaves are used, or they are made into cakes, balls or *pelotes*, as described in the treatise.

It is a notorious fact, among well taught, scientific and experienced dyers, that a deep, permanent, and brilliant blue cannot be produced, unless the *indigo-vat* is fermented with woad. It has long been used in France, Germany and Holland, in preparing the *indigo-vats* in the best manufactories of those countries, and is now used in England; for it is found impossible to imitate the justly celebrated NAVAL BLUES of France without it. A more perfect fermentation is thereby produced, and the particles of indigo consequently more uniformly held in solution. The colouring pigment, prepared in this manner, attaches itself so firmly to the fabrics, that cloths thus dyed appear of a deep uniform and beautiful blue; the colour does not rub off, and never fades by exposure to wet, heat or the air, but remains permanent and unchanged.

There is no art less perfectly understood in this country, than dyeing; and it has been owing exclusively to the exertions of the first chemists of Europe, that it has been reduced to a permanent system, and the whole process conducted on known established principles.

Formerly there was a mysteriousness in the process, which for a long time excluded all attempts at investigation. Those who practised in the art, made it a point to keep, as important secrets, whatever they knew, and, like the manufacturers of glass, suffered no inspection of their labours, lest they should be robbed of an imaginary treasure. There were no means within their power of detecting the causes of failure in the preparation of their vats, for they were ignorant of the chemical effects of the different ingredients used. They merely knew from practice, or tradition, that a certain combination of materials made a red, blue, yellow or green dye, and if from an injudicious admixture the anticipated result did not take place, they merely said *they had "bad luck."*

Long custom had created prejudices, which forbade instruction, and, like many individuals of every mechanic art, the dyers laid it down as an axiom, that nothing useful could be learned from books, or instruction communicated by individuals, who had not served an apprenticeship, and laboured in the same vocation.

The vast strides which have been made in knowledge during the last fifty years, have not been confined to the schools of the literati, or only known to the secluded philosopher.

Useful discoveries in the arts, instead of merely giving eclat to the laborious investigator and patient experimentalist, have been extensively disseminated.

The perfection of European manufactories is attributed to chemical investigation.

The superior manufactories of painters' colours, earthenware, and porcelain, soap, medicinal preparations, the working of metals, the art of dyeing and distilling, and the astonishing improvements in agriculture, are some of the important effects, which have resulted from the chemical pursuits of the learned individuals, societies and academies of the last half century.

Although the United States have progressed in civilization and the arts, in a manner unparalled in the annals of nations, still much remains for inquiry: and it is the duty of every citizen to contribute, by every means within his power, whatever may tend to advance the best interests of all classes of society, and render our nation industrious, learned, independent and happy. With great respect,

Your obedient servant,

H. A. S. DEARBORN.

COTTON HATS.

MR. SKINNER—It has been truly and prettily said, that he, who causes two spears of grass to grow where only one before stood, is a benefactor of mankind. The pursuit, in which you, and many other gentlemen of our country, are engaged, gives you claims to the title of benefactors of mankind. The new spirit and zeal in agriculture, and in all departments of husbandry, which your editorial labours have created, tend a thousand times more to the good of the community, than the political bickerings of our news-papers. I hope the whole community will continue their attention to the noble subject of Agriculture; and that you will long find your pleasure and profit, in fostering a pursuit in which we are all so much concerned.

The same feelings and the same motives, which create the greatest enjoyments derived from agricultural pursuits, will naturally inspire regard for every improvement, every invention, and every institution, in any degree connected with the comfort, convenience, and prosperity of the farmer and planter. Hence every art, calculated to consume, at little cost to the husbandman, the products of his labour, and create demand for the repetition of his crops and his harvests, concerns him as much as the market price of his wheat, and his corn, and his cotton in the great shipping towns; and the more so, as he may be assured, that the skill and the labour of the artist may also be rewarded, by every new metamorphosis which the staple products of his grounds shall undergo. The farmer produces his wheat, in doing which his servants or hirelings are supported—the miller, the mill-right, the lumber merchant, the engineer, the cooper, the merchant, the baker, and finally the consumer, all follow in his train—who can look along

this list with indifference—so of the cotton planter. He is not alone concerned in the destinies of the tender plant which he so carefully nurses, and cultivates. Its product at last interests and occupies the skill and labour of a thousand others. And every contrivance or discovery, which will consume the contents of two where that of one pod or bowl was before consumed, enhances the value of the commodity to the grower; so that, in the end, it will be found there is no natural hostility between agriculture and the arts employed in applying to various uses its various products. Indeed what would there be to inspire the ploughman, if the fruits of his labour were not to be converted by artists, into a thousand shapes, to administer to the taste and comfort of consumers? Were it not for the necessities of others, he would need no more than the bare supplies for himself; and this would prove the measure of his industry and emulation. His fine fields would become wildernesses; and all his taste & polish, & all his spirit, would be transformed into the desires, and habits, & sensuality of a savage. Sir, the arts stimulate agricultural industry; and you and your virtuous coadjutors, already, display a deep interest in them. Every new modification of the staples of the country concern you. Then let me ask your attention to a beautiful invention for the manufacture of hats from cotton. The hat I had the pleasure of shewing you the other day being in the window of the manufacturer, I was struck with its beauty; and walking into the shop inquired its price. My surprize was great indeed, on being answered, *two dollars and a half!* I did not perceive the reason, but my difficulties were all settled by the information of the shop-keeper. It is the cotton hat, said he—well, it looks quite as handsome as the beaver, will it wear as well? Quite as well, and as long as the beaver on your head said he, and for which I dare say you gave nine dollars. Here is the proof added he, taking up a hat from the counter; this hat has been worn eleven months, during which time, it has performed two voyages to the West-Indies. I examined the hat, and found it as good, in colour and texture, as any beaver I ever saw worn as long and under like circumstances. I bought a white hat, which I have now worn two weeks, I have no reason to doubt, that, in six months trial, it will prove to be a good hat.—many gentlemen admire it, and ask me, where I procured it.

I am not only interested in the very great difference in the cost of the cotton hat compared with a beaver, but in the prospect that the manufacture will consume a great quantity of cotton. Here then the planter has also an interest in the manufacture, for every hat will consume less or more of his commodity, and consequently increase the demand. The hat I now wear is made of the Sea-Island cotton, and I never saw that material transformed to greater advantage from a raw state to a fine fabric. This case may serve, among a thousand others I could put, to illustrate the intimate connection between agriculture and the arts; and how much it is for the interests of the votaries of both to draw together.

Mr. Editor, you will afford a more particular account of the article I have cited for your notice, by inserting here the description of the invention by the patentee.

I am with great esteem,
Sir, your most obedient, &c.
E. HARLOW CUMMINS.

THE HISTORY OF COTTON HATS.

Ingenious and inventive individuals amongst Hat Manufacturers, have long considered it an object meriting the most vigilant search to discover some method whereby cotton might be advantageously manufactured into hats. With a fibre as fine, and as strong as the fur of the Beaver, and susceptible of a more permanent colour, perfectly free from those coarse hairs inseparable from fur, it was evident that if some method could be devised whereby cotton could be wrought into Hats, it would prove an important acquisition to our country; inasmuch as it would be the means of supplying our citizens with Hats of equal fineness and durability with the Beaver, at a much lower price; and also, as it must afford a valuable article for exportation, wherefore the Agriculturist, the Merchant and the Manufacturer, were alike interested in the attainment of this object, consequently various plans were formerly suggested & experiments tried to discover some process whereby cotton could be wrought into Hats like fur, but all in vain, and the project was then abandoned. But a young man from Ohio, subsequently formed the idea of making Hats of birch bark and covering them with cotton plush; he communicated his plans to me and some experiments were made, without much success. Other persons in different places made Hats of paper and covered them in the same way, but a shower of rain destroyed them at once. At length an ingenious shoe-maker near Boston, having become acquainted with the qualities of certain Gums in rendering not only leather, but paper also impervious to water, devised a method of putting paper Hats together with cement, rendering them completely water proof throughout, after which, he covered them with cotton plush, and they justly obtained a considerable degree of celebrity in the vicinity where they were made. In this stage of the progress of the business, in the beginning of the year 1819, I commenced manufacturing Cotton Hats, being fully convinced that in the hands of a skilfull hat manufacturer, the business might be so improved as to gratify every wish that had been felt on the subject. Finding by experience the method then practised deficient in many respects, which rendered the hats liable to various objections, I commenced and prosecuted a series of experiments which resulted in the discovery of a superior set of apparatus for putting the hats together, and also of a cement for rendering them impervious to water, and for more firmly cementing the Plush to the paper, which is much more elastic and durable than the kind before used, and greatly increases the strength of the hats. I now make the bodies of my improved elastic Water Proof Hats of a peculiar kind of paper manufactured from canvass expressly for the purpose, possessing great strength and durability when preserved from wet: the paper is oiled and coated several times with the above mentioned cement.—The best Sea Island Cotton only will be used in future, which is spun and wove into a very strong cloth upon one side of which a thick strong nap is raised, it is then coloured with the most permanent black dye, after which the hats are covered with it; being previously prepared as before described, the cloth and paper are firmly united into one body by means of the aforesaid cement; thus each part strengthening and preserving the other, affords a light, handsome and durable hat, of a quality suitable for the first man in the nation, and at a price within the reach of all.

I have obtained a patent for my improvements, and now respectfully invite each citizen and stranger to buy a Cotton Hat and give it a fair trial. An extensive assortment for men and boys, black and drab colours, and some with green unders, also fancifully trimmed children's Jockies may be seen, and are offered for sale at No. 200 Front street, corner of Fulton street New York, No. 41, South 3d Street Philadelphia, and 20 1-2 Market-street, near the Marsh Market Baltimore, by the single Hat, dozen and gross.—It is recommended that the men may be careful to avoid unnecessarily bruising them, to brush them frequently so as to keep the nap smooth and clean: occasionally moistening the nap with a little sweet oil by brushing it over the hat, will increase the lustre and preserve a fine jet black, by this means they will wear bright and handsome for a very long time, retaining their shape, their nap and their colour as long at least as beaver hats. To guard against imposition the lining in future will be stamped with the name of the subscriber, or that of Thomas Buffum & Co. Baltimore.

ARNOLD BUFFUM.

Baltimore, 15th May, 1821.

ASPARAGUS.

How to Sow, Plant, and Cultivate it.

Sir—Choose a flat and rather low piece of ground, on the south side of your garden for your bed. If you do not mean to plant roots or seed in the spring, I would recommend you to manure it very highly, and raise a bed of cabbage or potatoes on it in the summer; manure it in the fall again, and leave it till the next spring. But if you design to plant in the spring, I would recommend you to turn in a heavy top dressing of manure, that has been well beaten with a flail, into small pieces when spread; after this is turned in, and before you rake, lay on a top dressing of soapers ashes. To a bed of ten feet wide, by 140 feet long, put about 15 bushels, but if the ground be very poor, 25 bushels would not be too much; this is to be chopped in with hoes, and then well raked; next make deep drills, flat at the bottom; if your bed be large, these may be run with a shovel plough, making a man lead the horse, having first traced them by a line, and the small end of a garden hoe; as soon as you have made one of them, clean it out with a spade, and plant it before you make another. The roots should be well spread out, and lay quite flat, and not pointing their extremities upwards; the crown of each root should be about two and a half or three inches below the surface when finished. The old rule was to put plants one foot each way. But I think that erroneous, and would advise you to place them two feet one way and one foot the other; that is to say, make the rows 2 feet apart, & put the plants 1 foot distant from each other in your row. By the old method the quantity of manure soon surfeited the earth & the plants dwindled. But by this new method, you can very conveniently give the bed any degree of richness and greatly forward the growth of the young plants, not only by digging between the rows to loosen the earth, but you may deposit manure in such places, and heave the dirt on the top of the bed; after the first deposit this is always exquisitely fine *Top Dressing*. Another error is in making the beds too narrow. If my ground were not very wet, I would greatly prefer to have all of my Asparagus in one great bed, and that relieved at the margin about one foot, and boarded up so as never to require any edge dressing. In the usual way of making beds four feet wide, the two rows near the edges, are always indifferent, and much trouble every spring in dressing them up. My present beds are about ten feet wide, so that a person going on each side can cut the whole without treading on them.

It is now rather late for roots, though you may plant them in October, as both spring and fall planting succeed—but fall planting does best in upland.

You may safely depart from the old rule of high ground, for I know that Asparagus will grow on a beach;—and it will be earlier when in low ground to my certain knowledge—so often do people miss their aim by attempting to lead nature by the hand, instead of trying to peep into her habits, and imitate

her work. If you follow the rule I have laid down, you may cover your beds in winter with leaves, and confine them with a layer of corn-stalks, and early in April or the last of March, if dry and in a safe situation, burn it down upon the bed which will give them a good top dressing. Any kind of manure will do to put between the rows; but I recommend that some animal manure be put in for a permanent job; after the plants are full grown, bones and leather cuttings, would be excellent, and last seven or fourteen years. But if you intend to sow the seed, then after the bed is prepared as before stated, plant a seed rubbed out of the pod one inch deep at every four inches, so that the surplus may be extracted when they grow. From my own experience, I do not think that a single day will be lost by using seed, for I have had roots from seed in seven months, that would weigh nearly a quarter of a pound each; seed may be sown any time this month, and the beds must be kept very clean from grass and weeds.

SUMMARY.

The old method.—High ground, narrow beds, close planting, great richness, and subtratum at the outset. The error of this in every particular I have experienced.

The new method.—Low ground, wide beds, wide planting, so as to increase the proportion of earth, raise its quality by degrees, and finally to use a variety of manures, and depositing them between the rows, which takes off greatly from the first labour.

S. V. S.

Baltimore County, May 1.

WHITLOW, OR PARONYCHIA OF THE *MEDICAL BOOKS*.—How to treat it.

This disease is often a severe affliction to hard working men, such as farmers. It originates from bruises or punctures that inflame the muscles, tendons or membranes beneath the skin—these swelling, whilst the hard tough skin of the fingers remains unyielding, causes the great pain, and extension of it up the arm—the thick skin of the fingers also prevents any exudation or escape of purulent matter, and thus the bone becomes diseased, and a joint is lost. Persons with soft fingers are seldom attacked. An artificial and similar disease may be formed at any time by winding a string round an inflamed finger, or by sewing it up in a piece of unyielding leather. In this case the most stupid person would think only of cutting the string or ripping the leather, and yet it is rarely that you see a physician go to work in this rational manner. He must first salve it, and plaster it with some ointment, which is just as likely to make a cure as the treading on it, that is practised by ignorant people before it becomes intolerable—by such practices and such neglect, the disease often runs on till *nature* makes a gap, and the physician *modestly* charges for what another has done.—The proper remedy is simple and easy; lay open the thick skin, the whole length of the swelling, and dress the finger for one or two days with a soft poultice of bread and milk, and then lay lint on the wound—a little red precipitate ointment may be necessary where the proud flesh does not suppurate freely. The writer of this has relieved a great many persons without the loss of a joint, and has followed no other plan for twenty years.

MEDICUS.

P. S.—The palm of the hand is sometimes the seat of the disease, and a very affecting case of this kind lately occurred in Baltimore county, of a female who had brought it on by excessive work, to supply the deficiency of a lazy husband.

HAND MILLS,
FOR FARM PURPOSES.

City of Washington, April 16th, 1821.

Dear Sir,

I have observed in No. 2 of the American Farmer, volume 3d, a letter from Athanasius Fenwick, Esq. chairman of the St. Mary's County Agricultural Society, relative to portable mills, such as were used in the French armies in Spain, &c. Some time ago, several numbers of "Le Moniteur Universel" were sent to me; and from the one of 12th Jan. 1819, I extracted the enclosed advertisment—altho' the mill therein described is not portable, it appears, however, to be of the kind required by the St. Mary's Society, and I should suppose it might be so constructed as to grind Indian corn. Make such use of the advertisement as you may think proper.

Your most obedient,

John S. Skinner, Esq. C. F.

From "Le Moniteur Universel."

Paris, January 12th, 1819.

"The drought experienced for several months past, is prolonged by the present state of the temperature, which induces us to call the attention of proprietors and cultivators, to the wheat-mill, invented by Mr. Quentin Durand, director of the Repository of Inventions and Models belonging to the Duke de Berry, established in Bussey-street, No. 19, Paris." The Editors further remark, that the following details are extracted from a prospectus, now lying before them; and in which it is declared by the inventors, "that more than 800 mills have already been sold at their forges—these, upon trial, had to contend with slight difficulties, which were surmounted easily, and led to some improvements, or alterations that were followed by the happiest effects; so that these wheat-mills now represent the combined workmanship of all the known wind and water mills.—Judging, therefore, by the demands and constant orders received from every place in which the cultivators have had an opportunity of seeing them in complete operation, the inventors hope to sell many millions. Several persons have confounded the name of Durand, with that of Messrs. Durand and Son, locksmiths, mechanicians and inventors of hand-mills with small mill stones, published in 1793, which were the best inventions of the kind known at that time; but since then, twenty-five years have elapsed, in which the arts have made great progress. The smallest mill of Messrs. Durand and Son, which cost 520 francs,* could not grind more than four pounds of flour, in the bran, per hour, or sixty pounds of flour, per day. But our mill, on the contrary, which costs only 60 francs in Paris, or 70 francs† delivered free of expense in any other part of France, will yield from twenty to twenty-five pounds of superfine flour, per hour, and requires only one man, or boy to work it. The mill of 1793 was cumbersome, but these occupy only a small space, and require no repair except the graining, which in an hour's time may be revived by any one."

* About $100. † About 11, or $13.

THE FARMER.

Baltimore, Friday, June 1, 1821.

ERRATA.

Our readers will please make the following corrections in the article on a Dairy, &c. page 71, No. 9.

For *Cluffed*, read *Chaffed* hay, in the heading.

For *Roasted*, read *Washed* sand, about midway in the second column.

For *bave* two walls, read *have* two walls, just below, the above.

For *such as bushel measures, &c.* read, *with ears* such as bushel measures have, near the foot of the second column.

PRICES CURRENT.

Flour, from the wagons, $4—*Whiskey*, from ditto, 24 cents per gallon, exclusive of barrel, 27 cts. do. including barrel—*Hay*, per ton $18 a 20—*Straw*, $7 a 8 per ton—Wheat, White 80 to 83 cts. per bushel—Red, do 76 a 79 cts.—*Corn*, 30 to 31 cents per do—*Oats*, 23 a 25—*Rye*, 40—*Barley*, 25 to 30 p. bu.—*Cod Fish*, per quintal, wholesale $3, retail ditto $4—New-England *Beans* per bushel, $1 12½—ditto *Peas*, 75 cents—*Plaster* in stone $6 per ton—do. ground, $1 35 per barrel, 33 cents per bushel, $8 per ton—New Orleans *Sugar* $9 to 12 50—Muscovado do. $7 50 to 9 25—American *White Lead*, $12 50—Ground, do. $13 a 14—*Linseed Oil*, 75 cts—*Feathers*, 40 to 45 cts—*Potatoes*, per bushel, 62½ to 75 cts—*Shad*, new, $6—*Herrings*, $2 to 2 25, declining—Fine *Salt*, 50 per bushel—Ground Alum do. 46 to 48—St. Ubes, 50—Cadiz, 50 to 55—Turks' Island, 75—Cadiz ditto, 60—Live *Cattle*, 5 to $5 50—*Beef*, 8 to 10 cts—*Hams*, 10 to 12 cts.—*Middlings*,—10 cts—*Butter*, 20 to 25 cts—*Eggs*, 12½ cts—*Cheese*, 8 to 10 cts. pr lb—*Tar*, $1 50—*Turpentine*, $1 87½ to $2; *Pitch*, $2½; *Rosin*, common 1¾, bright do. $3 per barrel,—*Varnish*, 25 cts—*Spirits turpentine*, 33 cts per gal.—*Cotton*, good Upland, 13 a 15 cts. very dull—*Rice*, 3 a 3½ cts.—ship and flooring *Plank*, $25 to 27—*Shingles*, best 6½, to $7, com. $3 to 4½ p. M.

No change in the price of Maryland Tobacco since last week. A few hhds. of Virginia Tobacco sold at 6½.

STRAW CUTTER, &c.

The subscriber has just completed and has for sale, a quantity of

Hyde's Straw Cutting Machines.

They are made of the best materials, and combine simplicity, economy, durability, and labour saving; they can be applied to horse, steam or water power; also, to cut corn stalks, hay, clover, &c. from half an inch to two inches; the principal knife is permanent; the axle or cylinder contains three pressures, which act as a shears; it feeds itself by rollers, and works by spur wheels; every revolution of the balance wheel cuts three times. He challenges any state or individual in the union, to come forward and prove their equal.

He has also for sale, a quantity of BOX CHURNS of sizes, which will make butter in a short time A liberal discount will be allowed to retailers, in town or country. Any commands left at CASEY'S SEED STORE, No. 2, Hanover-street, next door to Barnum's Hotel, at the work shop, opposite, or at Sutliff's Livery Stables near the Marsh market, will be attended to JOHN GILL.